Energy Division Comparison of Performance-Based Renewables Incentives Adopted In Germany, Spain, Washington, and New Mexico

To assist parties with assessing proposals for pay-for-performance solar incentives, Energy Division staff prepared a brief analysis of similar incentives models offered in two European Union countries (Germany and Spain), and two states (Washington and New Mexico). This report does not provide a comprehensive history or assessment of the respective programs, but rather examines how the incentive mechanisms work. Table 1 provides a summary of these mechanisms.

The German and Spanish models are the most mature performance-based programs. These countries design and measure the success of their respective incentive policies to encourage solar generation in various terms. Installed capacity is an obvious measurement. A refined assessment could compare installed capacity to the targets set for the specific policy. Policy may also be evaluated on the cost basis, in terms of the costs of solar energy produced, of financial support, and whether either cost category is reduced over time. In developing incentive structures, Energy Division encourages parties to consider and discuss the goals to be achieved under the CSI.

Table 1. Solar Production Incentives
US cents per kWh*

Location	Capacity Range	Building Integrated	Rooftop	All other	Decline
Germany[1] PV 2004	Up to 30 kW 30 to 100 kW 100 kW to 5MW	75.5 72.1 71.4	69.5 66.1 65.3	55.3 (all sizes)	Up to 6.5% per year.
Spain PV and CSP[2] 2004	Up to 100 KW Over 100 KW			55.7 29.1	Determined annually.
Washington PV 2006	Any, but geared to 3 kW systems			15.0 to 54.0	None, but annual incentive capped at $2,000.
New Mexico PV 2006	Up to 10 KW			13.0	None.

*Euro to USD as of 2/1/2006

[1] http://www.bsi-solar.de/english/information/EEG
[2] http://www.idae.es/index

Legislators in both countries adopted aggressive targets for electricity generation from renewable sources which resemble California's Renewable Portfolio Standard, and developed incentives and grid access protocols to ensure the targets would be met.[3] The two countries emphasize technologies which complement regional attributes. German incentives favor off-shore wind and building-integrated photovoltaics, while Spain emphasizes solar-thermal power plants.

Solar Incentives In Germany

In 2004, Germany increased previously established renewable generation targets to 12.5% in 2010 and 20% in 2020.[4] To meet these targets, legislators approved a law to increase incentive amounts, require grid operators to provide priority interconnection access to renewable generation, and require grid operators and/or utilities to purchase electricity produced from renewable sources at premium prices. Tariffs are set for each individual technology (wind, solar, biomass, and others) based on capacity size, physical configuration, and actual generation production costs.

Electricity generated by photovoltaics receives per kilowatthour (kWh) incentives for twenty years after becoming operational. Incentives are fixed, not market-based, and decline 6.5 percent annually for new installations. In general, solar projects up to 5 MW capacity size are eligible. Building-integrated PV projects receive higher incentives than non-integrated rooftop PV. The incentive tariff includes an adjustment mechanism to pay higher incentives for solar projects installed in less optimal locations.[5] Payment structures are revisited every two years to reflect actual site-and technology-specific generation costs, which German policymakers believe will mitigate the risk of over-subsidization.

To improve market transparency, grid operators must publish purchased renewable energy volumes and payment prices.

Spain

Spain recently adopted a similar approach, with a few notable differences. In 1999 Spain set a goal for renewable resources to comprise 12% of all energy sources, and 29% of electricity generation, by 2010. This includes a specific goal to install 200 MW of

[3] The European Union subsequently proposed similar member goals.
[4] Initial renewables targets and protocols were legislated in 2000.
[5] This mechanism is used primarily to encourage wind projects.

solar thermal electric power plants, also known as concentrated solar power (CSP) by 2010.[6] Project owners may elect to receive production incentives based on one of two methodologies: the wholesale electricity market price plus an incentive premium, or a fixed price set by a regulatory authority (ranging between 300% and 575% of the prevailing electricity tariff). The project must remain on the selected tariff for 12 months, at which time the owner may again select one option over the other, which remains based on the year the plant became operational.

Incentives for new systems may be reduced or increased annually. If a solar plant is commissioned at a particularly favorable time, and compensation is subsequently increased, the risk of over-subsidization increases.

Washington

In 2005, Washington became the first state to adopt a production incentive. PV systems earn a fixed credit of 15 cents per kWh up to $2000 annually. The credit increases as high as 54 cents if the project's components are manufactured in Washington. The incentive is in addition to the state's net metering program. The approach was tailored to the yearly market output of a typical 3.5 kW system. Incentives are available through June 2016.

New Mexico

On March 1, 2006, PNM, New Mexico's largest electric and natural gas utility company, will begin accepting applications for a PV incentive program for retail customers. PNM will purchase Renewable Energy Certificates (RECs) from customers with grid-connected systems 10 KW or under. The payment will be calculated at 13 cents per kWh produced, with one kWh creating one REC. The payment will be applied as a credit to the participant's electricity bill. A check will be sent to the applicant if system production exceeds onsite consumption.

[6] Spain is considering a proposal to increase the CSP goal to 500 MW by 2010.